CHAPTER 1

CHOOSING AND SELECTING: EVOLUTIONARY PSYCHOLOGY APPLIED TO PERSONNEL PSYCHOLOGY

Evolutionary psychology is concerned with applying Darwinian evolutionary reasoning to understand and predict human behaviour. It has made its way quite rapidly into disciplines like cognitive psychology, personality psychology, and social psychology. However, very few studies in occupational psychology explicitly use insights from evolutionary psychology. This might be partly because evolutionary psychology is for a good part a meta-theory and integrates different results from many fields. The result is that it is working two levels of application higher then an applied psychology discipline. Personnel psychology, for instance, takes much of its inspiration from personality psychology, while personality takes some of its inspiration from evolutionary psychology. Naturally, the first need of researchers concerned with developing theories and methods that can be applied to personnel psychology, is not so much putting results and theories in an evolutionary perspective, but rather applying theories from parent disciplines such as personality psychology. Nevertheless, personnel psychology can take advantage of the insights of evolutionary psychology, and particularly from parental investment theory. Evolutionary psychology has generated a plethora of findings regarding sex differences, attractiveness, and personality that may be relevant to personnel psychology and organisational psychology.

There are a few issues discernable where evolutionary psychology has already made a limited impact on occupational psychology (for a recent overview see Colarelli, 2003). For example, in the realm of sexual harassment within organisations, Bourgeois and Perkins (2003) tested evolutionary hypotheses about how the negative experience of sexual harassment is moderated by status of the harasser and the social situation: high status harassers appear to cause more negative feelings, but this was only the case when there was a power difference between the harasser and the victim. Studd (1996) compared evolutionary and feminist perspectives on sexual harassment by reviewing the literature and analysing reported harassment cases that were settled outside court (see also Studd & Gattiker, 1991). Within the realm or personnel selection, Colarelli, Hechanova-Alampay and Canali (2002) researched the content of letters of recommendation to test evolutionary hypotheses. They predicted that letters of recommendation will reflect status and mating interests of the recommenders. This was the case: the strength of the relationship between recommenders and applicants influenced the favourability and length of the letters. That is, the better they knew each other, the more favourable the letters were. Moreover, male recommenders wrote more favourable letters for female than for male applicants, Colarelli et al. concluded that evolved interests and preferences related to partner choice and intrasexual competition are triggered when writing letters of recommendation. In addition, there are a few articles in which evolutionary and anthropological insights are applied to organisational design and research (see Colarelli, 2003; Jones, 2003; Nicholson, 1997; Nicholson, 2000; Nicholson, 2001; Pierce & White, 1999;

Sandelands, 2002; White & Pierce, 1999). In short, there is not much explicit evolutionary I/O psychology, and especially empirical research is lacking.

Evolutionary Psychology

In its broadest sense, there are two ways to explain behaviour. Proximate explanations look at behaviour in terms of events in the immediate, proximal environment. Loosely speaking, they deal with "how" questions. An ultimate explanation on the other hand refers to the evolutionary significance or function of the behaviour, a "why" question. For instance: why do most people and many other animals sometimes show their teeth? Several proximate "how" answers are possible: because the muscles that pull up the upper lip are activated, because we are angry, because we are threatened by somebody with a large stick or because they are insulted at a meeting, and many more. An ultimate "why" answer would be "because during the course of evolution, it has been adaptive, and built in by evolution to show your willingness to fight by showing the things you fight with like your teeth". Ultimate and proximate explanations are not competitive explanations, but complementary explanations. One is not better than the other is; it all depends on which level answers are informative to the specific question. Ultimate explanations often go against direct or conscious experience, and sometimes sound far-fetched. However, knowledge of ultimate causes may enhance our understanding of human behaviour.

Evolutionary psychology argues that evolution designed the human cognitive system in a certain environment and that this knowledge helps us understand current human behaviour. Because evolution is a very slow process, and the human species is a very young species, it is unlikely that there has been enough time to radically change our genome since the rise of *Homo sapiens*. Therefore, the minds and brains of our ancestors were probably not very different from ours, and this means that we still show behaviour that was adaptive for our ancestors' environment, the Environment of Evolutionary Adaptedness (EEA). Evolutionary psychology certainly does not maintain that this behaviour is necessarily also adaptive in our environment. It also does not say that all behaviour is adaptive. It does say that knowledge of evolution and the EEA is helpful in understanding human behaviour.

Evolutionary Psychology and Sex differences: Parental Investment Theory

There are two different selection processes: natural selection and sexual selection. Sometimes natural selection means both natural selection and sexual selection, but I shall use both terms specifically. Natural selection is concerned with survival. It determines which individuals will survive the struggle for existence, for food, water, shelter and not failing prey to diseases and predators too soon. Sexual selection determines the extent to which individuals actually reproduce themselves. It takes two forms: choosing partners (partner choice) and keeping competitors of the same sex at bay (intrasexual competition).

Parental investment (Trivers, 1972; 1996) is the investment by parents in offspring. This investment enhances the fitness of the offspring, but diminishes the opportunity for the parents to invest in other offspring. This means that there is an optimum between mating

effort and parental effort. The sexes differ in their initial parental effort. That sex that invests the smallest sex cells, usually the male sex[1], makes initially the least parental effort, but the most mating effort. A sperm cell may weigh 200.000 times less than an ovum. Due to this initial high investment, the most investing sex is forced to keep investing more than the less investing sex, simply because there is more to loose. The reproduction rate of the low investing sex (usually males) is very much dependent on the accessibility of mates: the low investing sex have become mating specialists. The other sex performs the most hatching, internal gestation, lactation, and parenting. The high investing sex (usually females) have become parenting specialists, and their reproduction rate is dependent on availability of resources, not on accessibility of mates. The low investing sex is competing for mates, while the high investing sex is choosing mates.
This difference in reproduction strategy results in "female choice, male competition". Females will choose males that will enhance the fitness of their offspring. Males can provide protection, food, in short resources to their mates and offspring. In primates, especially in humans, not only cues of the *ability* to invest in offspring such as possession of resources or status, but also cues of the *willingness* to invest time and resources in offspring such as perceived preparedness to invest in a relationship with the mother or with her offspring, are important selection criteria (Barrett, Dunbar, & Lycett, 2002; for recent overviews of human evolutionary psychology see Buss, 1999b; Mealey, 2000; Palmer & Palmer, 2002). The other things males contribute to offspring are their genes. Females may also select mates with markers of **"**good genes**"**. Those markers can be good health, but they can also be quite "arbitrary". Zahavi (1975) proposes that females prefer those features that indicate fitness by being actual handicaps for survival. The classical example of this is the peacock's tail (Cronin, 1991), the sight of which made Darwin sick: in 1860, he wrote to Asa Gray, "*...I remember well the time when the thought of the eye made me cold all over, but I have got over this stage of the complaint, and now small trifling particulars of structure often make me very uncomfortable. The sight of a feather in a peacock's tail, whenever I gaze at it, makes me sick*!"

Sexual Selection, Attractiveness, Symmetry and Personality

Sexual selection is relevant to understand sex differences in personality. In sexual selection, not only physical resources like good genes are important, but also the control of environmental resources. Especially in female mate choice, environmental resources of men are important, because this is what men can invest besides their genes. Control of resources is, almost by definition, highly correlated with the position in the social system (Betzig, 1986; Eibl-Eibesfeldt, 1989). It should not come as a surprise then, that women prefer high status men more than men prefer high status women (Buss, 1999b). This means that men have to be more concerned with acquiring and showing status if they are to be reproductively successful. They will show more dominance, i.e. behaviours that are concerned with getting, keeping and showing status than do women (Moskowitz, 1993; Pratto, 1996). Moreover, men, not much burdened by the task of reproduction, have many opportunities to play status

[1] But not always. For instance, in sea horses the genetically males are the high investing sex. This gives us the opportunity to test hypotheses about the causes and origins of sex differences in parental behaviour.

games. Perhaps hunting itself may be thought of as a status game: anthropological studies have shown that hunting is not a very efficient way to get calories compared to gathering (Wood & Eagly, 2002). We can expect that women will be less inclined to play status games, but instead will put more emphasis on relational aspects, showing more affiliation (Buss & Malamuth, 1996; see Taylor et al., 2000).

The results of this will be gender differences in personality. The Interpersonal Circumplex (Gurtman & Pincus, 2000; Wiggins, 1979) was developed to explain individual differences in personal interaction. Its two main axes are Affiliation and Dominance (Ashton, Jackson, Helmes, & Paunonen, 1998b; Budaev, 1999; Wiggins & Trobst, 2002). Studies using the Interpersonal Circumplex find universal sex differences in Dominance and Affiliation, with men scoring higher on Dominance and Women higher on Affiliation (see Costa, Terracciano, & McCrae, 2001b; Feingold, 1994; Moskowitz, Suh, & Desaulniers, 1994).

Affiliation and dominance are the ink with which human interaction is written. Men are usually physically larger, and probably because of this more verbally and physically aggressive, and they are also more engaged in status and dominance struggles, a universal finding (Eibl-Eibesfeldt, 1989; Wood & Eagly, 2002). In a comprehensive overview article concerning relational communication studied in anthropology, psychotherapy, biological approaches, semantic approaches, interpersonal evaluation research, and developmental research, Burgoon and Hale (1984) found the two most important dimensions to be dominance and affiliation. Also ethological studies of humans (Salter, 1995) and chimpanzees (De Waal, 1996), as well as studies in personality and social psychology (Gifford & Hine, 1994; Gifford & O'Connor, 1987; Moskowitz, 1994; Wiggins, 1996) all find dominance and affiliation as the main dimensions of interpersonal behaviour. Studying the way men and women express affiliation and dominance in their interactions is a key factor in understanding human social behaviour and sex differences.

Personnel Psychology and Sex Differences

Sex differences are often addressed in relation to fairness in personnel-related decision making. Fairness, i.e. making decisions on valid measurements in the sense that they are highly correlated with work outcome variables presupposes lack of bias: when instruments are biased, it is all but impossible to make fair decisions. The technical term bias refers to a distortion in statistics or measurement of test scores or ratings. Bias occurs if there are systematic group differences in score distributions or indices of validity for reasons that are unrelated to the trait under consideration. Instead, such differences are caused by interference of intervening variables like stereotypes, culture, self-esteem (e.g. Barrett, 1998; Conway, Jako, & Goodman, 1995; Guion, 1998; Hough, Oswald, & Ployhart, 2001). For instance, when attractive people are assessed more positively by assessors while attractiveness is not a criterion for job success, attractiveness bias occurs, resulting in unfair and possibly counterproductive selection procedures. Of course, when attractiveness is relevant to job success, it is perfectly rational to include it in the set of predictors. However, if attractiveness still influences the scores on presumably unrelated traits (say, intelligence), attractiveness bias still may occur. Often, the assumption is made that all group differences reflect bias in the

used instruments. Of course, this is only justified if one can be sure that the difference does not reflect a real difference between the groups (Guion, 1998). Whether group differences in test scores are caused by measurement bias or not can only be settled by additional research.
Research into rater bias is concerned with influences such as ethnicity, sex, cognitive variables, personality variables or attractiveness of assessors and applicants on the reliability or validity of ratings (Buttner & McEnally, 1996; Foster, Dingman, Muscolino, & Jankowski, 1996; for a model, see Landy & Farr, 1983; Walsh, Weinberg, & Fairfield, 1987; Watkins & Johnston, 2000). Evolutionary psychology can make substantial contributions to this research with regard to understanding sex differences and the role of attractiveness.
Bias in standardised tests is a real possibility, but in less standardized, more subjective methods of selection, bias is even more a threat to fairness. The often used methods of ratings or interviews are much less standardized, less reliable and more subjective, but yield possibly other more useful information for selection decisions than standardised tests. Validity generalisation is a special kind of meta-analysis technique that enables researchers to combine the results of many predictive validity studies; for reviews of validity generalization, see Murphy (2003). A validity generalization study by Schmidt and Hunter (1998) showed that procedures that combine a general mental ability test with a structured interview have the highest predictive validity. Interviews and ratings also have high face validity, and so they are often used. In fact, although ability tests are often used in personnel selection, in many selection procedures an unstructured or badly structured interview is the only selection instrument. This means rater bias caused by sex differences of raters and ratees, the attractiveness of ratees and the interaction between these variables are an important potential threat to validity and fairness.
Indeed, attractiveness often turns out to be an important variable that causes bias in personnel decisions. Meta-analyses by Cesare (1996) of validity studies and one by Hosoda, Stone-Romero and Coats (2003) of experimental studies have confirmed that attractive people have more chances to get selected or promoted in the occupational domain than non-attractive people, a finding that is not confined to western societies, but is also found in a South-East Asian society (Chiu & Babcock, 2002). Cesare (1996) found more bias against non-attractive women than against non-attractive men, while Hosada et al. (2003) found no sex differences, but caution that this could be because of the general nature of their study: sex differences regarding attractiveness might be domain specific (Feingold, 1992; Feingold, 1994; Jackson, Hunter, & Hodge, 1995). Moreover, professionals appear to be as susceptible to attractiveness bias as non-professionals (Hosoda, Stone-Romero, & Coats, 2003; Marlowe, Schneider, & Nelson, 1996).

Evolved Sex Differences and Occupational Segregation

Bias in selection and promotion might be a part of the answer to the question why women are underrepresented in demanding and high status jobs. However, differences in ambition and work orientation might provide a partial answer too. Indeed, it is likely that sex differences in personality and behaviour will have an impact on work related behaviour. Women might be less inclined than men to apply for and stay in competitive and high status

jobs because on average women may be less competitive and less interested in status. Evolutionary psychological research into sex differences and parental investment theory have indeed shown that cross-culturally men are more competitive, dominant and ambitious then women (for overviews, see Barrett, Dunbar, & Lycett, 2002; Buss, 1999b; Costa, Terracciano, & McCrae, 2001b; Wood & Eagly, 2002). Differences in ambition and competitiveness will result in self-selection of possible job incumbents. This self-selection caused by low levels of ambition and competitiveness would diminish the pool of suitable women candidates relative to that of men of high status jobs. A recent study by Van Vianen and Fisher (2002) showed that women's overall ambition was lower than men's, and that organisation culture influenced women's career choices (see also Eagly & Johnson, 1990; and Eagly, Karau, Miner, & Johnson, 1994).

There may be a biological base for sex differences in competitiveness, and related to that in ambition. Competitiveness is influenced by hormones during development and daily behaviour. Studies that related testosterone with aggressive and competitive behaviour in contact sports all found that in men higher testosterone levels were related to more competitive behaviour, and winning caused a testosterone boost after the match (Filaire, Maso, Sagnol, Lac, & Ferrand, 2001; Gonzalez-Bono, Salvador, Ricarte, Serrano, & Arnedo, 2000; Mazur, Booth, & Dabbs, 1992; Salvador, Suay, Gonzalez-Bono, & Serrano, 2003; Salvador, Simon, Suay, & Llorens, 1987; Salvador, Suay, Martinez-Sanchis, Simon, & Brain, 1999; Serrano, Salvador, Gonzalez-Bono, Sanchis, & Suay, 2000; Wagner, Flinn, & England, 2002). In women, the relation between testosterone and competitiveness is less clear. Testosterone might not be linked to a fright-fight-flight behavioural system in women, but to a tend-and-befriend system (Taylor et al., 2000). The evolutionary explanation behind this is that women in the EEA (and now) usually cannot defend themselves by fighting against males, simply because men are much stronger (see for a meta analysis Hough, Oswald, & Ployhart, 2001). Forming and maintaining coalitions are the preferred female defense. Support for this comes from a study on female judoka's, where no testosterone boost was found after winning a match, and where the winner indeed showed more tending-and-befriending behaviour (Bateup, Booth, Shirtcliff, & Granger, 2002). In work-related behaviour, testosterone influences competitiveness and aggression, which has been demonstrated by studies using samples consisting of employees: testosterone appears to be related to competitiveness in trial lawyers, and social tendencies in fire fighters regarding the choice of their job content (Dabbs, de la Rue, & Williams, 1990; Dabbs, Alford, & Fielden, 1998; Fannin & Dabbs, 2003).

In sum, evolved sex differences in preferences regarding attractiveness causing bias in selection, and evolved behavioural sex differences in dominance and affiliation could provide a clue why men and women are found in different jobs.

This Dissertation

I will present three articles describing six empirical studies that apply an evolutionary perspective to personnel psychology. The first article is concerned with testing evolutionary hypotheses regarding sex differences in preferences for attractiveness in a personnel selection

setting. I expected that the influence of preferences that evolved during the course of human evolution regarding attractiveness of others would be discernable in modern personnel selection settings, because choosing people is exactly what these evolved preferences were meant to facilitate. If so, these evolved preferences will almost certainly introduce bias in these selection procedures. Is it possible to identify conditions in which evolutionary principles will be operating in such selection? In the first study, we addressed the question: do evolved preferences related to mate choice and intrasexual competition influence the choice of job applicants? In the second study, we tried to answer the question of whether expected contact intensity later on between the participants and the applicants influenced the choices of our participants. Finally, in a third and last experiment, we extended the results obtained among samples of students to Human Resource Management professionals.

The second article is concerned with the identification of behavioural sex differences in affiliation and dominance during a role-play in a real-life assessment centre. It is important to know if there are objective behavioural sex differences in social behaviour, because only this knowledge will enable us to assess bias and design fairer selection procedures.

The third article is concerned with evolved sex differences in ambition. Because of the division of labour and behavioural differences in competitiveness, it is to be expected that there are sex differences in ambition regarding work orientation. By means of four different questionnaire techniques that make it possible to couple life goals, situational demands and competitive and ambitious self-report behaviours, this hypothesis was tested.